Asthmatics and Activity

ASTHMA IS BY FAR the commonest chronic condition noted in children's absence from school. Asthmatics are unique in that running for one to two minutes may elicit bronchodilation and increased performance, whereas if continued for five to twelve minutes bronchial spasm results, either during or within ten minutes following the exercise. This exercise-induced bronchospasm (EIB) can be prevented by premedication with sympathomimetics or cromolyn sodium.

Breathing exercises (diaphragmatic and chest muscle training) and physical fitness programs (cardiovascular and neuromuscular conditioning) have not been found to provide objective evidence of improved spirometric performance. Subjectively, however, patients often feel that such training has diminished their wheezing.

Certain guidelines emerge for consideration:

- Physical training and physical education within the peer group is endorsed for all but those with severe asthma.
- Use of a bronchodilator is recommended 10 to 15 minutes before activity for those developing significant wheezing on exertion. Occasionally a postexercise dose is also indicated.
- Intermittent short bursts of exertion for 1 to 2 minutes are preferable to steady, prolonged strenuous activity.
- Some competitive sports are possible for asthmatics. The patient and his physician should become acquainted with the rules governing medications for competitors. Athletic rules related to drugs should remain consistent with the needs of these athletes.
- Swimming seems to be the best sport for asthmatics. Golf, bowling, badminton, archery, softball or baseball, ping-pong and even soccer are generally safe, while football, basketball, handball, tennis and running are often too strenuous.
- Asthmatics have many remissions and exacerbations, and personal or supervisory monitoring is advisable. Respiratory infections, pollution, wind, dampness and cold weather tend to adversely interfere with health and performance. Retiring to the sidelines or, better yet, to alternate activity (library, cafeteria, classroom) should be respected.
- Continuing inservice training of school personnel (administrators, teachers, athletic instructors, nurses), appropriate alternative activities, suitable orientation of parents, and interposition of responsible and knowledgeable physicians as consultants are desirable.

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REFERENCES

Ghory JE, Bailit IW, Bierman CW, et al: Report of a Committee on Rehabilitation Therapy—Exercise and asthma. J Allerg Clin Immunol 54:396-399, Dec 1974

Gribbin A: Nothing to sneeze at. National Observer, Mar 1974

Rapp D: Questions and Answers About Allergies, New York, Drake Publishers, 1974

Adverse Reactions to Ampicillin

SINCE AMPICILLIN was introduced into medical practice in 1961, it has become the most widely prescribed antibiotic in the United States. Skin reactions have been reported to occur in from 7.3 to 9.5 percent of patient populations. Such reactions are unrelated to age but are slightly more frequent among females. It is important to know whether this high incidence represents an allergic reaction because of the potential danger from administration of this or related penicillin drugs.

The skin reactions are generally two types: a maculopapular one occurring in 68 percent and urticaria-angioedema in 32 percent of affected patients. The maculopapular eruption usually begins 7 to 10 days after initiation of ampicillin and persists 3 to 5 days whether or not treatment is continued. The typical distribution is originally truncal, spreading to the extremities, and most abundant at pressure areas. It may or may not be pruritic and pyrogenic. Two different collaborative groups have been unable to find an immunological basis for the maculopapular reaction. Hypothesized explanations for this skin reaction include the release of bacterial endotoxins, some other manifestation of the underlying disease or the presence of toxic impurities in the drug.

The less common urticarial reaction was shown to be immunologically mediated in about 25 percent of those studied. This finding was based on evidence from skin tests to ampicillin, penicillin G, penicilloyl polylysine (the major determinant) and other minor determinants as well as hemagglutination titres and readministration of the drug. Anaphylactic reactions to ampicillin are no more frequent than those from penicillin G.

A maculopapular eruption during or after ampicillin therapy is not an absolute contraindication either to readministration of ampicillin or

another penicillin. An urticarial reaction to ampicillin is more likely to be an allergic reaction. Further administration of any penicillin should be avoided unless penicillin sensitivity can be disproved.

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REFERENCES

Bierman CW, Pierson WE, Zeitz, SJ, et al: Reactions associated with ampicillin therapy. JAMA 220:1098-1100, May 1972

Kerns DL, Shira JE, Go S, et al: Ampicillin rash in children. Amer J Dis Child 125:187-190, Feb 1973

Rational Use of Oral Theophylline in the Treatment of Chronic Asthma

THEOPHYLLINE has been used effectively in the clinical management of chronic bronchial asthma for nearly 40 years. Until recently, however, the value of oral theophylline preparations has been controversial because of variable dose-response relationships and reports of severe and sometimes unpredictable toxicity.

Theophylline is thought to produce bronchodilatation by inhibiting the enzyme (phosphodiesterase) responsible for the conversion of cyclic adenosine monophosphate (CAMP) to 5′ adenosine monophosphate (AMP). This results in higher levels of CAMP which promotes smooth muscle relaxation and prevents release of chemical mediators from the mast cell and basophil.

Recent pharmacokinetic studies of theophylline have provided information necessary for a more rational approach in the dose scheduling of this drug. Theophylline is metabolized almost entirely in the liver (10 percent is excreted unchanged by the kidney). The rate of metabolism, however, varies considerably between subjects, resulting in a rather broad range of plasma half-lives. Plasma concentrations between 10 and 20 micrograms (μg) per ml appear to provide optimal therapeutic effect; but when the concentration exceeds 20 μg per ml, the chances of having adverse side effects are increased.

The narrow margin of safety between therapeutic and toxic blood levels, and the intersubject variability of plasma half lives demand individualized dosing schedules if optimal response is to be obtained without adverse effects.

For oral theophylline therapy we suggest using USP aminophylline tablets or one of several theophylline elixir equivalents. A reasonable starting dose would be 4 mg per kg of body weight per dose on a schedule of every six hours. Based on clinical response, adverse effects and plasma theophylline levels, the dose and schedule can be adjusted to achieve optimal clinical response with minimal adverse effects. When necessary a sympathomimetic drug, ephedrine or metaproterenol could be added in appropriate dosage if the patient's asthma is not controlled on theophylline alone.

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REFERENCES

Jenne JW, Wyze E, Rood FS: Pharmacokinetics of theophylline. Clin Pharmacol Ther 13:349, May-Jun 1972

Mitenko PA, Ogilvie RI: Rational intravenous doses of theophylline. N Engl J Med 289:600-603, Sep 1973

Ellis EF, Eddy ED: Anhydrous theophylline equivalents of commercial theophylline formulations. J Allerg Clin Immunol 53:116-118, Feb 1974

Recent Advances in Diagnosis and Treatment of Hymenoptera Hypersensitivity

ANAPHYLACTIC REACTIONS from stinging insects of the order Hymenoptera—particularly the honey bee, hornet, wasp, yellow jacket and fire ant—are a serious medical problem. The diagnosis of Hymenoptera hypersensitivity is based essentially on a clinical history, while skin testing is mainly confirmatory and used to determine the antigen dilution for the initiation of immunotherapy (hyposensitization). The preparations presently approved for both testing and treatment are commercially available whole body extracts (WBE) of insects. Reported clinical results of immunotherapy using these extracts are excellent as data from the American Academy of Allergy Insect Committee Registry have shown that over 95 percent of treated persons had either no reaction or much milder reaction when subsequently restung.

There is conflicting evidence in the literature regarding the correlation of skin test reactivity and the severity of the reactions to stings. There is also considerable overlap in the concentration of WBE which will induce positive skin tests in sensitive and nonsensitive persons. This warrants the search for more sensitive diagnostic tests and more relevant antigens for testing and treatment.

Recent *in vitro* studies using histamine release